UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/813,466	03/20/2001	Bruno C. Silva	MICR0195	3599

27792 7590 03/26/2003

MICROSOFT CORPORATION
LAW OFFICES OF RONALD M. ANDERSON
600 108TH AVENUE N.E., SUITE 507
BELLEVUE, WA 98004

EXAMINER
GOOD JOHNSON, MOTILEWA

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 03/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/813,466	Applicant(s) SILVA, BRUNO C.	
	Examiner Motilewa A. Good-Johnson	Art Unit 2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This office action is responsive to the following communications: Application, filed 03/20/2001.

2. Claims 1-36 are pending in this application. Claims 1, 16 and 24 are independent claims. No claims have yet been amended.

3. The present title of the application is "Morph Map Based Real-Time Rendering" (as originally filed).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1-36 rejected under 35 U.S.C. 102(a) as being anticipated by Chen et al., *View Interpolation for Image Synthesis*, ACM, 1993, pages 279-288.

As per independent claim 1, a method for simulating a real-time rendering . . . comprising the steps of: a) precomputing data defining a behavior of light rays illuminating the object based on a plurality of input images, to produce a plurality of morph maps . . . ; b) Chen discloses in the preprocessing stage obtaining the input data and the destination data to create the morph map from the source to the destination, page 282, col. 2, section 3.1; in response to one of a user action and an event that

indicates the desired graphical effect, performing a transformation using the plurality of morph maps . . . ; and c) displaying the output image. Chen discloses mapping parameters and creating morph maps and using morph maps to compute shadows from area lights, page 283, col. 1, section 4.

With respect to dependent claim 2, precomputing comprises the step of producing data that include a blend factor. Chen discloses blending the pixel values by a coefficient, page 280, col. 2, section 2, paragraph 1.

With respect to dependent claim 3, precomputing comprises the step of producing data that include an additive factor that is used to control saturation of the output image. Chen discloses interpolation parameters for interactive interpolation, page 283, section 3.2.

With respect to dependent claim 4, precomputing comprises the step of tracing rays of light to determine the plurality of morph maps . . . Chen discloses global illumination effects such as specular inter-reflections, page 279, col. 2.

With respect to dependent claim 5, a) producing a plurality of warped images . . . ; Chen discloses warped images, page 280, col. 2, section 2, paragraph 1; and b) combining the plurality of warped images over a range, with a cross-dissolve, to produce successive output images . . . Chen discloses cross-dissolving the overlapping pixels to produce view independent images, page 280, col. 2, section 2, paragraph 2.

With respect to dependent claim 6, performing the transformation comprises the step of mapping a selected portion of a surface of the object onto a different part of the object to simulate an effect corresponding to movement . . . Chen discloses

transformation precomputed to a spatial offset vector for movement in the pixel screen space, page 281, section 2.1.

With respect to dependent claim 7, only pixels of the object that have been altered during the transformation to implement the effect are recomputed in the output image. Chen discloses precomputing transformation data and a correspondence map for pixels, which map to the new image, page 281, section 2.1.

With respect to dependent claim 8, a) providing a grid of cells that overlies and bounds pixels . . . ; b) for each cell of the grid, associating an arbitrary rectangle . . . ; and c) determining a union of all rectangles . . . Chen discloses employing a quad tree block and grouping the pixels together and moving the pixel blocks, page 280, col. 2, section 2, paragraph 3.

With respect to dependent claim 9, using an index to map between a region in an input image and a corresponding region in the output image, to determine which portion of one of the input image and the output image is changed . . . Chen discloses bit-direction mapping in a pixel-by-pixel correspondence from the source to the destination image, page 280.

With respect to dependent claim 10, a) mapping a texture onto the object in the output image; b) applying a reflection to the object . . . ; c) applying a refraction of the object . . . Chen discloses reflection mapping performed with separate maps for reflection map coordinates, page 280, col. 2, paragraph 1.

With respect to dependent claim 11, precomputing includes the step of storing anti-aliasing data for use in producing the output image. Chen discloses anti-aliasing in the morphed source image, page 283, section 3.3.

With respect to dependent claim 12, precomputing is based on one of a three-dimensional geometry of the input images and a set of properties of a material in the input images. Chen discloses interpolation of three dimensional images and texture maps, page 279, col. 1, abstract.

With respect to dependent claim 13, data produced in the step of precomputing includes a lookup table in which parameters used in producing the output image are stored. Chen discloses storing image correspondence data, page 280, col. 1, paragraph 1; and further discloses a look-up table for image warping, page 281, section 2.1.

With respect to dependent claims 14 and 15, they are rejected based upon similar rational as above independent claim 1.

As per independent claim 16, a method for simulating the rendering of graphical effects . . . comprising the steps of: a) precomputing a plurality of morph maps of a displayed scene . . . ; Chen discloses precomputing morph maps, page 280, col. 1, paragraph 1; b) storing the morph maps for subsequent use in simulating rendering of a selected effect . . . ; Chen discloses storing the precomputed morph maps, page 280, col. 2, paragraph 1; c) transforming at least one input image using a blending of the plurality of morph maps . . . ; Chen discloses blending the pixel values of warped

images to complete the morph ; and d) displaying the output image . . . Chen discloses displaying a scene, page 279, col. 2.

With respect to dependent claim 17, a) anti-aliasing to smooth edges in the output image; Chen discloses anti-aliasing the temporally over time, page 283, col. 1, section 4; b) displaying light refraction . . . ; c) displaying light reflection . . . ; Chen discloses reflection mapping performed with separate maps for reflection map coordinates, page 280, col. 2, paragraph 1; d) morphing between an object in the displayed scene and a substantially altered object . . . ; and e) dynamically warping a selected portion . . . Chen discloses warped images, page 280, col. 2, section 2, paragraph 1.

With respect to dependent claim 18, a) an index that identifies a pixel data set from among a plurality . . . ; Chen discloses the pixel data has a computed map coordinate, page 281, col. 1, section 2.1; b) an image identifier . . . that indicates one of: i) the input image . . . ; and ii) a constant color . . . ; Chen discloses filling an interpolated image with a distinguished background color, page 283, col. 2, section 3.2; c) coordinates of the pixel in the input image; Chen discloses linear interpolation of the pixel coordinates, page 281, col. 1, section 2.2 ; d) the constant color that is to be applied to the pixel . . . ; Chen discloses cross-dissolving the pixel colors, page 280, col. 2, section 2, paragraph 2, and further discloses filtering the color with the colors of a non-background pixel color, and retaining the color in the interpolated image, page 283, section 3.2; f) an additive factor used to shift the appearance . . . ; Chen discloses interpolation parameters for interactive interpolation, page 283, section 3.2. ; and g) a

blending factor . . . Chen discloses blending the pixel values by a coefficient, page 280, col. 2, section 2, paragraph 1.

With respect to dependent claim 19, precomputing comprises the step of computing the plurality of morph maps with a light simulating algorithm . . . Chen discloses computing shadows from light sources, page 284, section 4.3.

With respect to dependent claim 20, rendering of a textured patch on a surface of an object as the patch is dragged over the surface . . . Chen discloses interpolating the maps under a user's control to create in-between images, page 280, col. 1, paragraph 1.

With respect to dependent claim 21, rendering of an object simulating a refraction that occurs as light reflected from the object passes through a non-homogeneous medium . . . Chen discloses global illumination effects such as specular inter-reflections, page 279, col. 2.

With respect to dependent claim 22, only pixels in the input image that have changed are transformed to produce the output image. Chen discloses precomputing transformation data and a correspondence map for pixels, which map to the new image, page 281, section 2.1.

With respect to dependent claim 23, bi-directionally mapping between each of a plurality of pixels in a selected region of the input image and a corresponding pixel in a corresponding region of the output image . . . Chen discloses bi-direction mapping in a pixel-by-pixel correspondence form the source to the destination image, page 280.

As per independent claim 24 and dependent claims 25-36, they are rejected based upon similar rational as above independent claim 1 and dependent claims 2-15 respectively.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

5,613,048	Chen et al.	345/419	03/1997	

Three-dimensional image synthesis using view interpolation.

6,366,282 B1	Trika	345/423	04/2002	09/1998

Method and apparatus for morphing objects by subdividing and mapping portions of the objects.

6,407,743 B1	Jones	345/582	06/2002	12/1998

System and method for morphing based on multiple weighted parameters.

6,362,833 B2	Trika	345/646	02/2002	04/1995

Method and apparatus for progressively constructing a series of morphs between two-dimensional or three-dimensional models.

6,525,725 B1	Deering	345/419	02/2003	03/2000

Morphing decompression in a graphics system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Motilewa A. Good-Johnson whose telephone number is (703) 305-3939. The examiner can normally be reached on Monday - Friday 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on (703) 305-4713. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

Motilewa A. Good-Johnson
Examiner
Art Unit 2672

mgj
March 20, 2003

JEFFERY BRIER
PRIMARY EXAMINER